ARIZONA CTE PROGRAM TECHNICAL STANDARDS & MEASUREMENT CRITERIA

AUTOMOTIVE COLLISION REPAIR, 47.0600.30	
1.0	**PERFORM NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR**
1.1	Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan
1.2	Inspect, remove, label, store, and reinstall exterior trim and moldings
1.3	Inspect, remove, label, store, and reinstall interior trim and components
1.4	Inspect, remove, label, store, and reinstall body panels and components that may interfere with or be damaged during repair
1.5	Inspect, remove, label, store, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair
1.6	Protect panels, glass, interior parts, and other vehicles adjacent to the repair area
1.7	Wash entire vehicle with soap and water; complete pre-repair inspection checklist
1.8	Prepare damaged area using water-based and solvent-based cleaners
1.9	Remove corrosion protection, undercoatings, sealers, and other protective coatings as necessary to perform repairs
1.10	Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair
2.0	**PREFORM OUTER BODY PANEL REPAIRS, REPLACEMENTS, AND ADJUSTMENTS**
2.1	Determine the extent of direct and indirect/hidden damage and direction of impact; develop and document a repair plan
2.2	Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies
2.3	Determine the extent of damage to aluminum body panels; repair or replace
2.4	Inspect, remove, replace, and align hood, hood hinges, and hood latch
2.5	Inspect, remove, replace, and align deck lid, lid hinges, and lid latch
2.6	Inspect, remove, replace, and align doors, latches, hinges, and related hardware
2.7	Inspect, remove, replace and align tailgates, hatches, liftgates and sliding doors
2.8	Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware
2.9	Inspect, remove, replace and align fenders, and related panels
2.10	Straighten contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pulling attachments
2.11	Weld damaged or torn steel body panels; repair broken welds

2.12	Restore corrosion protection
2.13	Replace door skins
2.14	Restore sound deadeners and foam materials
2.15	Perform panel bonding and weld bonding
2.16	Diagnose and repair water leaks, dust leaks, and wind noise
2.17	Identify one-time use fasteners
3.0	**PERFORM METAL FINISHING AND BODY FILLING**
3.1	Remove paint from the damaged area of a body panel
3.2	Locate and repair surface irregularities on a damaged body panel
3.3	Demonstrate hammer and dolly techniques
3.4	Heat shrink stretched panel areas to proper contour
3.5	Cold shrink stretched panel areas to proper contour
3.6	Prepare and apply body filler
3.7	Identify different types of body fillers
3.8	Rough sand body filler to contour; finish sand
3.9	Determine the proper metal finishing techniques for aluminum
3.10	Determine proper application of body filler to aluminum
4.0	**DETERMINE MOVEABLE GLASS AND HARDWARE REQUIREMENTS**
4.1	Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls
4.2	Inspect, adjust, repair, remove, reinstall or replace weather-stripping
4.3	Inspect, repair or replace, and adjust removable power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs
4.4	Initialize electrical components as needed
5.0	**PERFORM METAL WELDING AND CUTTING**
5.1	Identify weldable and non-weldable substrates used in vehicle construction

5.2	Weld and cut high-strength steel and other steels
5.3	Weld and cut aluminum
5.4	Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation
5.5	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded
5.6	Store, handle, and install high-pressure gas cylinders
5.7	Determine work clamp (ground) location and attach
5.8	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions
5.9	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations
5.10	Protect computers and other electronic control modules during welding procedures
5.11	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, clamp or tack as required
5.12	Determine the joint type (butt weld with backing, lap, etc.) for weld being made
5.13	Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation
5.14	Perform the following welds: continuous, plug, butt weld with and without backing, fillet, etc.
5.15	Perform visual and destructive tests on each weld type
5.16	Identify the causes of various welding defects; make necessary adjustments
5.17	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments
5.18	Identify cutting process for different substrates and locations; perform cutting operation
5.19	Identify different methods of attaching non-structural components [squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.]
6.0	**PERFORM PLASTICS AND ADHESIVES REPAIRABILITY**
6.1	Identify the types of plastics; determine repairability
6.2	Clean and prepare the surface of plastic parts; identify the types of plastic repair procedures
6.3	Repair rigid, semi-rigid, or flexible plastic panels
6.4	Remove or repair damaged areas from rigid exterior composite panels
6.5	Replace bonded rigid exterior composite body panels; straighten or align panel supports

7.0	**APPLY SAFETY PRECAUTIONS WHEN PAINTING AND REFINISHING**
7.1	Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations
7.2	Identify safety and personal health hazards according to OSHA guidelines and the Right to Know Law
7.3	Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards
7.4	Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation
7.5	Select and use a NIOSH approved supplied air (Fresh Air Make-up) respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation
7.6	Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.)
8.0	**PERFORM SURFACE PREPARATION FOR PAINTING AND REFINISHING**
8.1	Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation
8.2	Wash entire vehicle with soap and water; use appropriate cleaner to remove contaminants
8.3	Inspect and identify type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system
8.4	Strip paint to bare substrate (paint removal)
8.5	Dry or wet sand areas to be refinished
8.6	Featheredge areas to be refinished
8.7	Apply suitable metal treatment or primer in accordance with total product systems
8.8	Mask and protect other areas that will not be refinished
8.9	Mix primer, primer-surfacer or primer-sealer
8.10	Identify a complimentary color or shade of undercoat to improve coverage
8.11	Apply primer onto surface of repaired area
8.12	Apply two-component finishing filler to minor surface imperfections
8.13	Block sand area to which primer-surfacer has been applied
8.14	Dry sand area to which finishing filler has been applied
8.15	Remove dust from area to be refinished, including cracks or moldings of adjacent areas

8.16	Clean area to be refinished using a final cleaning solution
8.17	Remove, with a tack rag, any dust or lint particles from the area to be refinished
8.18	Apply suitable sealer to the area being refinished
8.19	Scuff sand to remove nibs or imperfections from a sealer
8.20	Apply stone chip resistant coating
8.21	Restore caulking and seam sealers to repaired areas
8.22	Prepare adjacent panels for blending
8.23	Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures
8.24	Identify metal parts to be refinished; determine the materials needed, preparation, and refinishing procedures
9.0	**PERFORM SPRAY GUN AND RELATED EQUIPMENT OPERATION**
9.1	Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment)
9.2	Select spray gun setup (fluid needle, nozzle, and cap) for product being applied
9.3	Test and adjust spray gun using fluid, air and pattern control valves
9.4	Demonstrate an understanding of the operation of pressure spray equipment
10.0	**PERFORM PAINT MIXING, MATCHING, AND APPLYING PROCEDURES**
10.1	Identify color code by manufacturer's vehicle information label
10.2	Shake, stir, reduce, catalyze/activate, and strain refinish materials
10.3	Apply finish using appropriate spray techniques (gun arc, angle, distance, travel speed, and spray pattern overlap) for the finish being applied
10.4	Apply selected product on test or let-down panel; check for color match
10.5	Apply single stage topcoat
10.6	Apply basecoat/clearcoat for panel blending and panel refinishing
10.7	Apply basecoat/clearcoat for overall refinishing
10.8	Remove nibs or imperfections from basecoat
10.9	Refinish rigid or semi-rigid plastic part

10.10	Refinish flexible plastic parts
10.11	Apply multi-stage coats for panel blending and overall refinishing
10.12	Identify and mix paint using a formula
10.13	Identify poor hiding colors; determine necessary action
10.14	Tint color using formula to achieve a blendable match
10.15	Identify alternative color formula to achieve a blendable match
10.16	Identify the materials equipment, and preparation differences between solvent and waterborne technologies
11.0	**DETERMINE PAINT DEFECTS, CAUSES AND CURES**
11.1	Identify blistering (raising of the paint surface, air entrapment); determine the cause(s) and correct the condition
11.2	Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition
11.3	Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition
11.4	Identify lifting; determine the cause(s) and correct the condition
11.5	Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition
11.6	Identify orange peel; determine the cause(s) and correct the condition
11.7	Identify overspray; determine the cause(s) and correct the condition
11.8	Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition
11.9	Identify sags and runs in paint surface; determine the cause(s) and correct the condition
11.10	Identify sanding marks or sandscratch swelling; determine the cause(s) and correct the condition
11.11	Identify contour mapping/edge mapping while finish is drying; determine the cause(s) and correct the condition
11.12	Identify color difference (off-shade); determine the cause(s) and correct the condition
11.13	Identify tape tracking; determine the cause(s) and correct the condition
11.14	Identify low gloss condition; determine the cause(s) and correct the condition
11.15	Identify poor adhesion; determine the cause(s) and correct the condition
11.16	Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition

11.17	Identify corrosion; determine the cause(s) and correct the condition
11.18	Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition
11.19	Identify water spotting; determine the cause(s) and correct the condition
11.20	Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition
11.21	Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition
11.22	Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition
11.23	Identify chalking (oxidation); determine the cause(s) and correct the condition
11.24	Identify bleed-through (staining); determine the cause(s) and correct the condition
11.25	Identify pin-holing; determine the cause(s) and correct the condition
11.26	Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition
11.27	Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition
12.0	**PERFORM FINAL PAINTING AND REFINISHING DETAIL**
12.1	Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.
12.2	Sand, buff and polish fresh or existing finish to remove defects as required
12.3	Clean interior, exterior, and glass
12.4	Clean body openings (door jambs and edges, etc.)
12.5	Remove overspray
12.6	Perform vehicle clean-up; complete quality control using a checklist
13.0	**PERFORM DAMAGE ANALYSIS**
13.1	Position the vehicle for inspection
13.2	Prepare vehicle for inspection by providing access to damaged area
13.3	Analyze damage to determine appropriate methods for overall repairs
13.4	Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage
13.5	Gather details of the incident/accident necessary to determine the full extent of vehicle damage

13.6	Identify and record pre-existing damage
13.7	Identify and record prior repairs
13.8	Perform visual inspection of structural components and members
13.9	Identify structural damage using measuring tools and equipment
13.10	Perform visual inspection of non-structural components and members
13.11	Determine parts, components, material type(s) and procedures necessary for a proper repair
13.12	Identify type and condition of finish; determine if refinishing is required
13.13	Identify suspension, electrical, and mechanical component physical damage
13.14	Identify safety systems physical damage
13.15	Identify interior component damage
13.16	Identify damage to add-on accessories and modifications
13.17	Identify single (one time) use components
14.0	**PERFORM ESTIMATION**
14.1	Determine and record customer/vehicle owner information
14.2	Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant
14.3	Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications
14.4	Identify safety systems; determine replacement items
14.5	Apply appropriate estimating and parts nomenclature (terminology)
14.6	Determine and apply appropriate estimating sequence
14.7	Utilize estimating guide procedure pages
14.8	Apply estimating guide footnotes and headnotes as needed
14.9	Estimate labor value for operations requiring judgment
14.10	Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish)
14.11	Select and price OEM parts; verify availability, compatibility, and condition

14.12	Select and price alternative/optional OEM parts; verify availability
14.13	Select and price aftermarket parts; verify availability, compatibility, and condition
14.14	Select and price recyclable/used parts; verify availability, compatibility and condition
14.15	Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition
14.16	Determine price and source of necessary sublet operation
14.17	Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items
14.18	Recognize and apply overlap deductions, included operations, and addition
14.19	Determine additional material and charges
14.20	Determine refinishing material and charges
14.21	Apply math skills to establish charges and totals
14.22	Interpret computer-assisted and manually written estimates; verify the information is current
14.23	Identify procedural differences between computer-assisted systems and manually written estimates
14.24	Identify procedures to restore corrosion protection; establish labor values, and material charges
14.25	Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value
14.26	Recognize the differences in estimation procedures when using different information provider systems
14.27	Verify accuracy of estimate compared to the actual repair and replacement operations
15.0	**DETERMINE VEHICLE CONSTRUCTION AND PARTS IDENTIFICATION**
15.1	Identify type of vehicle construction (space frame, unibody, body-over-frame)
15.2	Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles
15.3	Identify impact energy absorbing components
15.4	Identify steel types; determine repairability
15.5	Identify aluminum/magnesium components; determine repairability
15.6	Identify plastic/composite components; determine repairability
15.7	Identify vehicle glass components and repair/replacement procedures

15.8	Identify add-on accessories
16.0	**PERFORM CUSTOMER RELATIONS AND SELLING SKILLS**
16.1	Acknowledge and/or greet customer/client
16.2	Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations
16.3	Establish cooperative attitude with customer/client
16.4	Identify yourself to customer/client; offer assistance
16.5	Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process
16.6	Recognize basic claims handling procedures; explain to customer/client
16.7	Project positive attitude and professional appearance
16.8	Provide and review warranty information
16.9	Provide and review technical and consumer protection information
16.10	Estimate and explain duration of out-of-service time
16.11	Apply negotiation skills to obtain a mutual agreement
16.12	Interpret and explain manual or computer-assisted estimate to customer/client